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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/069,261	08/12/2002	Franz Durst	HMN 2 0020	1706

7590 08/18/2006  
Fay Sharpe Fagan  
Minnich & McKee  
7th Floor  
1100 Superior Avenue  
Cleveland, OH 44114-2518

EXAMINER
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NECKEL, ALEXA DOROSHENK

ART UNIT	PAPER NUMBER
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1764

DATE MAILED: 08/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/069,261

**Applicant(s)**

DURST ET AL.

**Examiner**

Alexa D. Neckel

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 05 June 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 3-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 3-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 June 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Drawings***

1. The drawings were received on June 5, 2006. These drawings are acceptable.

### ***Specification***

2. The disclosure continues to be objected to because of the following informalities:  
the specification lacks the appropriate headings.

Appropriate correction is required.

3. The title of the invention is not descriptive as a method is not being presently claimed. A new title is required that is clearly indicative of the invention to which the claims are directed.

### ***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 6 and 8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 6 lacks antecedent support in the disclosure to provide one with the "design" recited to achieve the claimed velocities. For examination purposes, the previously recited structural elements and relationships are treated as continuing to read on the "design".

Claim 8 recites the limitation "the free energy" in lines 4-5 of the claim. There is insufficient antecedent basis for the limitations in the claim.

***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 3, 5-9 and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Martin et al. (5,165,884).

With respect to claim 3, Martin et al. discloses a device comprising:

a combustion chamber (within shell 17) with a supply line (32) to the chamber and an additional supply line which is connected to a low combustion value gas supply (water) (col. 5, lines 63-68).

It is noted that the manner of operating the device does not differentiate the apparatus claims from the prior art. MPEP 2114. Additionally, the material or article worked upon also does not limit the apparatus claims. MPEP 2115.

With respect to claim 5, figures 1 and 2 illustrate a pre-mixing of the flue and oxidant before combustion.

With respect to claim 6, the velocity in the pre-mix area would inherently be greater than in the combustion chamber since the combustion chamber comprises ceramic saddles, balls and membranes which would slow velocity.

With respect to claims 7 and 9, no further structural limitations are recited therefore continues to read on the device of Martin et al. It is noted that the manner of operating the device does not differentiate the apparatus claims from the prior art.

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MPEP 2114. Additionally, the material or article worked upon also does not limit the apparatus claims. MPEP 2115.

With respect to claim 8, the surfaces of the device reasonably appear to be of such a size and proportion so as to achieve safe use of the device.

With respect to claim 16, the chamber reasonably appears to be designed so that flame stability is achieved over or under pressure since all of the previously recited structural limitations have been met.

8. Claims 3 and 10-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Durst et al. (5,522,723).

With respect to claim 3, Durst et al. discloses a device comprising:

a combustion chamber (within housing 1) with a supply line (2) to the chamber and an additional supply line (9) which is connected to a low combustion value gas supply (water/steam) (col. 11, lines 11-15).

It is noted that the manner of operating the device does not differentiate the apparatus claims from the prior art. MPEP 2114. Additionally, the material or article worked upon also does not limit the apparatus claims. MPEP 2115.

With respect to claim 10, Durst et al. further discloses wherein the combustion chamber has a porous material with inter-connected hollow spaces (col. 4, lines 23-30) suitable in size for flame development (col. 3, lines 6-8).

With respect to claims 11 and 12, the porous material porosity changes over to larger pores in the direction toward the flame (see figure 1) with a critical Péclet number

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(zone B) at an inner border area (col. 2, lines 21-30) and pore sizes different than that of zones A and C.

With respect to claim 13, Durst et al. further discloses wherein the porous material can be spheres (col. 4, lines 53-55).

***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 3, 5-9 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Martin et al. (5,165,884) in view of either Brock et al. (5,334,012), Ariyama et al. (6,053,962) or Hinke et al. (6,063,348).

With respect to claim 3, Martin et al. discloses a device comprising:

a combustion chamber (within shell 17) with a supply line (32) to the chamber and an additional supply line which is connected to a low combustion value gas supply (water) (col. 5, lines 63-68).

Martin et al. fails to disclose a supply of low combustion value gas to be feed into the combustion chamber.

Each of Brock et al., Ariyama et al., and Hinke et al., teach providing a supply of low combustion value gas (such as flue gas, steam or nitrogen) in order to reduce NOx emissions and control combustion temperature (Brock et al. (col. 1, lines 30-33); Ariyama et al. (col. 23, lines 46-50); and Hinke et al. (col. 1, lines 32-35)). It would have

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been obvious to one of ordinary skill in the art at the time of the invention to provide a supply of flue gas, steam or nitrogen to the burner combustion chamber of Martin et al. in order to achieve the recognized advantages of doing such, including reducing NO<sub>x</sub> emissions and to control combustion temperature.

It is noted that the manner of operating the device does not differentiate the apparatus claims from the prior art. MPEP 2114. Additionally, the material or article worked upon also does not limit the apparatus claims. MPEP 2115.

With respect to claim 5, figures 1 and 2 illustrate a pre-mixing of the flue and oxidant before combustion.

With respect to claim 6, the velocity in the pre-mix area would inherently be greater than in the combustion chamber since the combustion chamber comprises ceramic saddles, balls and membranes which would slow velocity.

With respect to claims 7 and 9, no further structural limitations are recited therefore continues to read on the device of Martin et al. It is noted that the manner of operating the device does not differentiate the apparatus claims from the prior art. MPEP 2114. Additionally, the material or article worked upon also does not limit the apparatus claims. MPEP 2115.

With respect to claim 8, the surfaces of the device reasonably appear to be of such a size and proportion so as to achieve safe use of the device.

With respect to claim 16, the chamber reasonably appears to be designed so that flame stability is achieved over or under pressure since all of the previously recited structural limitations have been met.

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11. Claims 3 and 10-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Durst et al. (5,522,723) in view of either Brock et al. (5,334,012), Ariyama et al. (6,053,962) or Hinke et al. (6,063,348).

With respect to claim 3, Durst et al. discloses a device comprising:

a combustion chamber (within housing 1) with a supply line (2) to the chamber and an additional supply line (9) which is connected to a low combustion value gas supply (water/steam) (col. 11, lines 11-15).

Durst et al. fails to disclose a supply of low combustion value gas to be feed into the combustion chamber.

Each of Brock et al., Ariyama et al., and Hinke et al., teach providing a supply of low combustion value gas (such as flue gas, steam or nitrogen) in order to reduce NOx emissions and control combustion temperature (Brock et al. (col. 1, lines 30-33); Ariyama et al. (col. 23, lines 46-50); and Hinke et al. (col. 1, lines 32-35)). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide a supply of flue gas, steam or nitrogen to the burner combustion chamber of Durst et al. in order to achieve the recognized advantages of doing such, including reducing NOx emissions and to control combustion temperature.

It is noted that the manner of operating the device does not differentiate the apparatus claims from the prior art. MPEP 2114. Additionally, the material or article worked upon also does not limit the apparatus claims. MPEP 2115.



With respect to claim 10, Durst et al. further discloses wherein the combustion chamber has a porous material with inter-connected hollow spaces (col. 4, lines 23-30) suitable in size for flame development (col. 3, lines 6-8).

With respect to claims 11 and 12, the porous material porosity changes over to larger pores in the direction toward the flame (see figure 1) with a critical Péclet number (zone B) at an inner border area (col. 2, lines 21-30) and pore sizes different than that of zones A and C.

With respect to claim 13, Durst et al. further discloses wherein the porous material can be spheres (col. 4, lines 53-55).

12. Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Durst et al. (5,522,723) alone or in view of Brock et al. (5,334,012), Ariyama et al. (6,053,962) or Hinke et al. (6,063,348), as applied to claim 13 above, and further in view of Martin et al. (5,165,884).

With respect to claim 14, Durst et al. discloses all of the structure as discussed above, but fails to disclose a grid provided between the areas of differing porosity.

Martin et al. discloses a similar combustion device and teaches wherein gas permeable barriers can be utilized to maintain the integrity of the matrix of porous bodies so that adjacent layers of materials of differing sizes do not become mixed (col. 10, lines 26-34). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the gas permeable barriers of Martin et al. in the apparatus of Durst et al. in order to control the location of the various sized materials in their respective zones.

With respect to claim 15, no further structural limitations are recited therefore continues to read on the device of Durst et al. It is noted that the manner of operating the device does not differentiate the apparatus claims from the prior art. MPEP 2114. Additionally, the material or article worked upon also does not limit the apparatus claims. MPEP 2115.

Even so, Durst et al. does disclose wherein the entire apparatus is cooled by exterior (8) and interior (9) cooling devices.

13. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Martin et al. (5,165,884) alone or in view of Brock et al. (5,334,012), Ariyama et al. (6,053,962) or Hinke et al. (6,063,348) as applied to claim 3 above, and further in view of Noakes et al. (5,110,563).

With respect to claim 4, Martin et al. discloses all of the structure as described above, including pre-heating the supply feed (see figures 1 and 2), but fails to disclose wherein combustion product is supplied via a supply line to the combustion chamber.

Noakes et al. discloses a combustion device and teaches wherein recycling part of the hot product gas to the combustion zone pre-heats the feed and renders combustion easier (col. 2, lines 16-19). It would have been obvious to one of ordinary skill in the art at the time the invention was made to re-use the hot product gas of Martin et al. in the manner taught by Noakes et al. in order to further pre-heat the feed as required by Martin et al. in addition to making use of a product generated by operation of the device.

***Response to Arguments***

**Specification**

The objection to the specification with regard to lacking headings is maintained, the remaining objections are withdrawn due to applicant's amendments.

**Drawings**

The objections to the drawings are withdrawn due to applicant's arguments and amendments.

**35 USC 112, Second Paragraph**

The rejections under 35 USC 112, second paragraph of claims 4 and 16 are withdrawn due to applicant's amendments.

The rejection of claim 6 is maintained. While the specification provides support for the phrase "designed in such a manner..." there is no support as to what the specifically recited design entails.

In claim 8, applicant has corrected the antecedent basis for "lateral surfaces" and "side wall" but has not corrected "the free energy".

**35 USC 102**

Applicant argues that neither Martin nor Durst teach a low combustion value gas supply.

The examiner respectfully disagrees, as presented above, and has further presented new rejections under 35 USC 103 regarding this feature.

***Conclusion***

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexa D. Neckel whose telephone number is 571-272-1446. The examiner can normally be reached on Monday - Thursday from 9:00 AM - 7:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on 571-272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Alexa D. Neckel  
Primary Examiner  
Art Unit 1764

August 16, 2006